

Appl. No.: 10/696,242  
Reply to Office Action of: 03/09/2005

**Amendments to the Drawings:**

Attached are sheets of formal drawings which should overcome the examiner's objection to the drawings.

REMARKS

In regard to paragraphs 1-3 of the office action, new formal drawings are submitted herewith.

In regard to paragraphs 4-5 of the office action, the specification has been amended above to overcome the examiner's objections.

In regard to paragraph 6 of the office action, claim 20 has been amended. Claim 21 has not been amended. The preamble in method claim 21 has not been amended because the amendment is not necessary (some examiners don't want the word "the" before "steps" based upon the belief that there is no antecedent basis for "the steps", some do want the word "the" before "steps"). Unless the examiners at the USPTO can decide on a common wording format, there appears to be no reason to change the language.

In regard to paragraph 7 of the office action, the claims have been amended above to overcome the examiner's rejections except for the language "general tube section". This language is used in the specification (see for example paragraph 0027, line 7). A person skilled in the art would understand the claim language when read in light of the specification. The "general tube section" is clearly shown in the drawings and described in the specification. Any change to that term might erroneously be considered a narrowing amendment. The examiner is requested to reconsider his rejection regarding the term "general tube section."

Claims 3, 4, 10 and 22 have been converted from dependent form into independent form. This change in form does not narrow or limit the scope of those claim. The independent claims which claims 3, 4, 10 and 22 were formerly dependent upon have not been cancelled. Therefore, the full scope of the doctrine of equivalents should apply to claims 3, 4, 10 and 22 as if they were originally presented in independent form when the application was filed. In view of paragraphs 11 and 12 of the office action, claims 3, 4, 10 and 22 should be in condition for allowance.

Claims 15 and 16 have been allowed without any amendments, and given the examiner's reason for allowance, should be give the broadest possible reasonable scope including under the doctrine of equivalents.

Claims 1, 2, 9, 11, 14, 21 and 23 were rejected under 35 U.S.C. §103(a) as being unpatentable over Young et al. (US 2004/0262957) or Saunders et al. (US 2003/0220766) in view of Lim (US 5,959,557). The examiner is requested to reconsider this rejection.

Claim 1 has been amended above to clarify applicants' claimed invention. In particular, claim 1 claims the Hall effect sensor and the overmolded housing are adapted to be connected as a single subassembly to a flexible printed circuit at a substantially same time. As noted in the application:

"Field repair is also virtually impossible with a conventional sensor assembly. The size and delicacy of the Hall effect sensor, and the complexity of assembling the current conventional design array, make replacing a

failed Hall effect sensor impractical by a vehicle dealership. Field repair is now possible and practical with the present invention. The large number of components in a conventional assembly also increases the manufacturing costs and assembly time. The present invention reduces the number of components and provide the component is easier to handle subassemblies."

"The present invention can use overmolding of a housing member onto the Hall effect sensor to protect the Hall effect sensor from damaged during assembly. With the present invention, the magnet and the Hall effect sensor are held in parallel at all times. The present invention can retain the magnet and the Hall effect sensor in alignment along a common Z or normal axis because the Hall effect sensor is molded into a base of the magnet-spring tower. The design allows the Hall effect sensor, along with the entire magnet-spring tower, to be changed relatively quickly. The magnet and Hall effect sensor are contained in one subassembly; the sensor assembly 26. Thus, field repair is now possible and practical. The present invention also allows the use of a fewer number of components than the conventional design. The present invention also provides a fewer number of assembly steps."

Nowhere in the cited art is there a disclosure or suggestion of a Hall effect sensor and an overmolded housing that are adapted to be connected as a single subassembly to a flexible printed circuit at a substantially same time. Even if, for the sake of argument, it was obvious to modify Young et al. or

Saunders et al. in view of Lim to overmold a housing onto the Hall effect sensors, this would appear to only be possible **after** the Hall effect sensors were connected to the flexible printed circuit mat. The overmolded housing of the invention claimed in claim 1 is overmolded to the Hall effect sensor before connection to the flexible printed circuit as shown in Fig. 7 and described in the application. Thus, they are connected to the flexible printed circuit as a subassembly unit at substantially the same time. There is no disclosure or suggestion of a Hall effect sensor and an overmolded housing that are adapted to be connected as a single subassembly to a flexible printed circuit at a substantially same time in the cited art. With applicants' invention, field repair is relatively easy and fast unlike the systems in Young et al. or Saunders et al. which only show the housings totally covering the connections of the Hall effect sensors to the flexible printed circuit. The features of claim 1 are not disclosed or suggested in the cited art. Therefore, claim 1 is patentable and should be allowed.

Claim 21 has been amended above to clarify applicants' claimed invention. In particular, claim 21 claims the method including connecting the first housing member and the Hall effect sensor at a substantially same time as a single subassembly unit to the flexible printed circuit. The overmolded housing is overmolded to the Hall effect sensor to form the subassembly before connection to the flexible printed circuit as shown in Fig. 7 and, thus, are connected together as a single subassembly to the flexible printed circuit at a substantially same time. Nowhere in the cited art is there a

disclosure or suggestion of connecting an overmolded first housing member and a Hall effect sensor on the first housing member as a single subassembly unit to a flexible printed circuit at a substantially same time. In Young et al. or Saunders et al. the Hall effect sensors are connected to the flexible printed circuit **before** connection of the housing to the flexible printed circuit because the housings appear to completely over the Hall effect sensors. In Young et al. and Saunders et al. it appears that the Hall effect sensors must be connected to the flexible printed circuit before the housing is connected otherwise the Hall effect sensors would be covered by the housing and, therefore, be prevented from being connected to the flexible printed circuit because of the housing covering the Hall effect sensors. Thus, even if, for the sake of argument, it was obvious to modify Young et al. or Saunders et al. to provide an overmolded housing on the Hall effect sensors based upon the teachings of Lim, there still is no suggestion of connecting the first housing member and the Hall effect sensor as a single unit to the flexible printed circuit at a substantially same time as recited in claim 21. The features of claim 21 are not disclosed or suggested in the art of record. Therefore, claim 21 is patentable and should be allowed.

For all of the foregoing reasons, it is respectfully submitted that all of the claims now present in the application are clearly novel and patentable over the prior art of record. Accordingly, favorable reconsideration and allowance is respectfully requested. Should any unresolved issue remain,

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the examiner is invited to call applicants' attorney at the telephone number indicated below.

Respectfully submitted,

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